

WHAT IS CLAIMED IS:

1. A flexible shaft, comprising:
 - a flexible, elongated outer sheath;
 - at least one drive shaft disposed within the outer sheath; and
 - a moisture sensor disposed within the outer sheath configured to detect moisture within the outer sheath.
2. The flexible shaft according to claim 1, wherein the outer sheath is autoclavable.
3. The flexible shaft according to claim 2, wherein the outer sheath includes a fluoropolymer/silicone material.
4. The flexible shaft according to claim 1, further comprising:
 - a coupling connected to an end of the outer sheath; and
 - a memory unit disposed in the coupling.
5. The flexible shaft according to claim 4, wherein the memory unit stores data including at least one of serial number data, identification data and usage data.
6. The flexible shaft according to claim 5, further comprising:
 - a data transfer cable disposed within the outer sheath, wherein the memory unit is logically and electrically connected to the data transfer cable.
7. The flexible shaft according to claim 1, further comprising:
 - a coupling detachably connected to an end of the outer sheath, the coupling being configured to detachably couple to a surgical attachment.
8. The flexible shaft according to claim 7, wherein the detachable coupling includes a locking mechanism for detachably coupling to the outer sheath.
9. The flexible shaft according to claim 8, wherein the locking mechanism includes a flexible strip locking mechanism.

10. The flexible shaft according to claim 7, wherein the coupling includes an engagement shaft including grooves and a clip having flanges, the flanges being received in longitudinal slits of a hollow engagement member of a surgical attachment, the engagement shaft being received in the clip, the clip engaging the grooves .

11. A flexible shaft, comprising:

a flexible, elongated outer sheath;

at least one flexible drive shaft disposed within the outer sheath; and

a coupling connected to a distal end of the outer sheath configured to couple to a surgical attachment.

12. The flexible shaft according to claim 11, wherein the outer sheath is autoclavable.

13. The flexible shaft according to claim 12, wherein the outer sheath includes a fluoropolymer/silicone material.

14. The flexible shaft according to claim 11, wherein the coupling includes a locking mechanism so that the coupling attaches and detaches to the outer sheath.

15. The flexible shaft according to claim 11, wherein the locking mechanism includes a flexible strip locking mechanism.

16. The flexible shaft according to claim 11, wherein the coupling includes a connection mechanism configured to detachably couple to the surgical attachment.

17. The flexible shaft according to claim 16, wherein the connection mechanism includes an engagement shaft having grooves and a clip having flanges, the clip being configured to be received in a hollow engagement member of a surgical attachment, the flanges of the clip configured to engage in longitudinal slits of the hollow engagement member, the clip configured to receive and secure the engagement shaft in the hollow engagement member, and to frictionally engage with the grooves of the engagement shaft.

18. The flexible shaft according to claim 17, wherein the connection mechanism includes a hollow engagement member having longitudinal slits and a clip having flanges, the clip being disposed in the hollow engagement member, flanges of the clip engaging in the longitudinal slits, the clip configured to receive and secure an engagement shaft of a surgical attachment.

19. The flexible shaft according to claim 11, further comprising:

a moisture sensor disposed in the coupling and configured to detect moisture in one of the coupling and the outer sheath.

19. The flexible shaft according to claim 11, further comprising:

a memory unit disposed within one of the outer sheath and the coupling, the memory unit configured to store data.

20. The flexible shaft according to claim 19, wherein the memory unit stores data including at least one of serial number data, identification data and usage data.

21. A sleeve, comprising:

an elongated shaft configured to receive a flexible shaft therein; and

a securing arrangement configured to selectively and variably retain the elongated shaft in any one of a number of longitudinal positions along the flexible shaft.

22. The sleeve according to claim 21, wherein the elongated shaft is a generally shape-retaining shaft, the shaft configured to retain a longitudinal portion of the flexible shaft in a predetermined shape.

23. The sleeve according to claim 21, wherein the arrangement includes a housing including an o-ring, the arranged configured to retain the elongated shaft in a selected one of the longitudinal positions by compressing the o-ring.

24. A shaft arrangement, comprising:

an elongated flexible sheath;

at least one flexible drive shaft disposed in the flexible sheath;

a shape-retaining sleeve, at least a portion of the flexible sheath being disposed in the shape-retaining sleeve, the shape-retaining sleeve configured to maintain the at least portion of the flexible sheath in a predetermined shape; and
an arrangement variably securing the shape-retaining sleeve to the flexible sheath in any one of a number of longitudinal positions along the flexible sheath.

25. A surgical system, comprising:

an electro-mechanical driver;
an elongated, flexible sheath;
at least one drive shaft disposed within the flexible sheath;
a surgical attachment coupled to the at least one drive shaft, the electro-mechanical driver configured to drive the surgical attachment;
a shape-retaining sleeve, at least a portion of the flexible sleeve being disposed in the shape-retaining sleeve, the shape-retaining sleeve configured to maintain the at least portion of the flexible sheath in a predetermined shape; and
an arrangement variably securing the shape-retaining member to the flexible flexible sheath in any one of a number of longitudinal positions along the flexible sheath.

26. A sleeve, comprising:

a shape-retaining sleeve configured to receive a flexible shaft therein, the elongated shaft, the shape-retaining sleeve configured to maintain at least a portion of the flexible shaft in a desired shape.

21 26. The sleeve according to claim 26, further comprising:

an securing arrangement configured to selectively and variably retain the elongated shaft in any one of a number of longitudinal positions along the flexible shaft.

28 27. A flexible shaft, comprising:

a flexible, elongated outer sheath formed from an autoclavable material; and
a drive shaft disposed within the outer sheath.

29 28. The flexible shaft according to claim 27, wherein the outer sheath is formed from a combination of a fluoropolymer and silicone.

30 29. A coupling mechanism, comprising:

an engagement shaft having grooves; and

a clip having flanges, the clip configured to secure the engagement shaft in a hollow shaft of one of a flexible shaft and a surgical attachment;

wherein the clip is configured to be received in the hollow shaft, the flanges of the clip being received in longitudinal slits of the hollow shaft, and wherein the engagement shaft is configured to be received in the clip when the clip is received in the hollow shaft, the clip engaging the grooves of the engagement shaft.

30 30. A coupling mechanism, comprising:

a hollow shaft having longitudinal slits; and

a clip having flanges, the clip disposed in the hollow shaft, the flanges engaging in the longitudinal slits, the clip configured to receive and secure an engagement shaft of one of a flexible shaft and a surgical instrument in the hollow shaft.

31 31. The coupling mechanism according to claim 30, wherein the clip is configured to engage grooves of the engagement shaft when the engagement shaft is received in the clip.

32 32. A coupling, comprising:

a housing;

a rotatable drive shaft engagement member, at least a portion of the drive shaft engagement member disposed in the housing, the rotatable drive shaft engagement member configured to engage a rotatable drive shaft;

a magnet non-rotatably secured to the rotatable drive shaft engagement member; and

a Hall sensor disposed in the housing and adjacent to the magnet.

33 33. The coupling according to claim 32, wherein the rotatable drive shaft is driven by an electro-mechanical driver.

33. A coupling, comprising:

a housing;

a rotatable drive shaft engagement member, at least a portion of the rotatable drive shaft engagement member disposed in the housing, the rotatable drive shaft member configured to engage a rotatable drive shaft; and

a moisture sensor disposed in the housing configured to sense moisture in the housing.

2025-04-23 14:25:00